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THE SCHOOL PLANT GUIDE FOR PLANNING SCHOOL PLANTS OF PENNSYLVANIA. ARCHITECTURAL DESIGN REQUIREMENTS AND GENERAL, ELECTRIC, HEATING AND VENTILATING, AND PLUMBING STANDARDS.

PENNSYLVANIA STATE DEPT. OF PUBLIC INSTRUCTION

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A GUIDE COVERING ARCHITECTURAL DESIGN REQUIREMENTS, ELECTRIC, HEATING AND VENTILATING, AND PLUMBING STANDARDS AS APPROVED BY THE STATE BOARD OF EDUCATION IN 1966. THE FOLLOWING MINIMUM STANDARD FOR NEW BUILDING, ALTERATIONS, AND ADDITIONS ARE OUTLINED--(1) SPATIAL ENVIRONMENTAL FACTORS, SUCH AS CEILING HEIGHTS, INTERIOR SANITARY FACILITIES, ROOMS BELOW GRADE, AND HEIGHTS FOR WORK SURFACES, (2) VISUAL ENVIRONMENTAL FACTORS, SUCH AS NATURAL LIGHTING, ARTIFICIAL LIGHTING, (3) SONIC ENVIRONMENTAL FACTORS, GENERAL ACOUSTIC REQUIREMENTS, (4) THERMAL ENVIRONMENTAL FACTORS, AS DESIGN TEMPERATURES, AIR MOTION, AND QUANTITY OF AIR SUPPLY, (5) SAFETY ENVIRONMENTAL FACTORS, AND (6) WORK PROCEDURES. SPECIFICATIONS INCLUDE AN ANALYSIS BY GRADE LEVELS AND GENERAL USAGE. (RH)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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Commonwealth of Pennsylvania
DEPARTMENT OF PUBLIC INSTRUCTION
Bureau of Building Construction
Harrisburg 17126

THE SCHOOL PLANT GUIDE
FOR
PLANNING SCHOOL PLANTS OF PENNSYLVANIA

Reproduced and Amended to February 1966

ARCHITECTURAL DESIGN REQUIREMENTS
and
General, Electric, Heating and Ventilating, and Plumbing Standards

Approved by the State Board of Education

(Department of Labor and Industry, Art Commission, and Department of Health regulations are not included)

EF 001069

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MINIMUM STANDARDS FOR NEW BUILDINGS, ALTERATIONS, AND ADDITIONS

A. Spatial (space) environmental factors should provide for adequate and economical use of space.

1. Areas.

(a). Instructional Use: This type of area includes consideration for all distinct subjects to be taught, such as kindergarten, language arts, industrial arts, fine arts, science, business, physical fitness.

(b). General Use: This type of area includes consideration for the administrative suite, health suite, instruction materials center, library, conference, activities, and other facilities that the entire school staff and student body would use.

(c). Service Use: This type of area includes consideration for custodial services, storage, food service, transportation, maintenance, equipment.

(d). See Recommended Areas for Elementary and Secondary School Building Facilities which should be used as a guide for developing various areas of use.

(e). Use-area recommendations for area vocational, community colleges, and state college should be referred to the technical advisory committee for review.

2. Ceiling Heights.

(a). The minimum ceiling height for a college or secondary classroom, 850 sq. ft. or less, shall be 9'-6". The minimum ceiling height for an elementary classroom, 850-900 sq. ft. or less, shall be 8'-6". However, such classroom areas as wardrobes, storage, and project work space, may have ceilings of not less than 8'-0".

(b). Elementary and secondary school buildings and college facilities, other than classrooms, should have ceiling heights which will adequately serve the educational function and the mechanical requirements of the space.

(c). Lighting fixtures and structural members may project into the space below a ceiling only when thermal comfort conditions and ratios, light levels, and lighting distribution are not adversely affected.

3. Interior Sanitary Facilities.

(a). Minimum sanitary fixture requirements.

Type of Fixture	Grades 1-3	Grades 4-6	Grades 7-16
(1). Water closets			
Girls' water closets (Used without urinals)*	Girls one to 30	Girls one to 30	Girls one to 45
Girls' water closets (Used in conjunction with urinals)*		Girls one to 60	Girls one to 90
Boys' water closets**	Boys one to 60	Boys one to 60	Boys one to 90
(2). Urinals			
Girls' urinals (Used in conjunction with water closets)*		Girls one to 30	Girls one to 30
Boys' urinals	Boys one to 30	Boys one to 30	Boys one to 30
(3). Lavatories			
Boys and Girls All grades	Pupils one to 50		

This ratio shall include individual classroom fixtures, except that there shall be at least two lavatories in every communal toilet room.

* In girls' toilet rooms, water closets without urinals are acceptable.
** In boys' toilet rooms, urinals are required.
***No toilet rooms for pupils, except auxiliary toilets, shall be placed in building basements.

(b). Communal toilet rooms.

All school buildings, including those with room toilets, shall have separate communal toilet rooms providing at least two water closets or equivalent for girls and two water closets and one urinal for boys with suitable number of lavatories.

(c). Powder room - sanitary booth - girls.

Each communal toilet used by girl pupils of the fourth through sixteenth grades shall be a combination powder room-toilet-lavatory.

The toilet room section shall provide one sanitary booth which is a toilet stall enclosure containing a water closet and wash basin and refuse container.

(d). Kindergarten and special education rooms.

Kindergarten and special education rooms shall be equipped with water closet and wash facilities separate from those used by the grades, preferably accessible directly from the classroom.

(e). Separate facilities for Grades 1-2-3.

Separate water closet and wash facilities may be provided and are recommended for at least each first, second, and third grade classroom, or if such are not deemed feasible, then small general toilet rooms may be provided for the lower elementary school grades, separate from the facilities used by older pupils.

(f). Special facilities.

Separate water closet and wash facilities shall be provided for administration, staff, men teachers, women teachers, custodians, cafeteria workers, health rooms, and shower and locker rooms. Such facilities should also be provided for student and public use, near the auditorium and the gymnasium.

(g). Drinking fountains.

(1). Elementary schools - one for each 50 pupils up to 250, then add one for each additional 100 pupils.

(2). Secondary schools and colleges - one for each 75 pupils up to 300, then add one for each additional 125 pupils up to 550 pupils, thereafter add one for each 200 pupils.

(3). Use angle-spray type with lip guard.

(4). Provide drinking fountains in kindergarten rooms which may be attached to the classroom sink or lavatory.

(5). Drinking fountains and sinks are required in all elementary school classrooms in new construction and recommended in all altered classrooms.

4. Rooms below grade - no room used for instructional purposes shall have its floor more than three feet below the outside grade of those sides that may contain major fenestration.

5. Consideration for heights of work surfaces, chalkboards, sinks, sanitary fixtures, drinking fountains, wardrobes, etc., shall be based on "Basic Body Measurements of School Age Children" (current edition) as published by the United States Department of Health, Education, and Welfare.

B. Visual environmental factors should provide for the right kind and amount of lighting.

1. Natural lighting. Unilateral, bilateral, or top lighting may be used; however, the basic principle of balance in lighting must be a factor in the satisfactory solution. The interrelationship of the visual and each of the other basic design factors must be acknowledged. The problems of glare, direct and reflected; and light source brightness in relation to the seeing task must be considered. Should natural lighting be reduced or eliminated, means must be developed to create interior or exterior vistas to fulfill the psychological need for the eye to wander beyond the confines of the instructional classroom space.

2. Artificial lighting. The selection of the level of illumination must be made only after many factors have been considered. The brightness balance must be related to the wide range of visual tasks to be performed at the varying grade levels.

3. "The American Standard Guide for School Lighting" (current edition) and "Illuminating Engineering Society Lighting Handbook" (current edition) shall be used as recommendations for the visual environmental factors to be developed throughout the school plant.

C. Sonic environmental factors should provide for proper hearing conditions.

1. Consideration must be given to the acoustical problems on the following basis.

(a). Effective sound insulation of individual rooms.

(b). Prevention or reduction of sound transmission from one activity to another.

(c). Elimination or reduction of sound interference from external sources, including mechanical equipment.

(d). Establishment of acoustical balance where good hearing is required.

(e). Reduction of unwanted sound.

2. In critical listening areas, it is recommended that the services of an independent acoustical consultant be used.

D. Thermal environmental factors should provide for the proper year around and day-to-day comfort and climate control.

1. Design temperatures, stated in degrees Fahrenheit, should be as follows:

(a). NON-AIR CONDITIONED

Room Classification	Design temperatures Degrees Fahrenheit
Instructional and general use areas - except as noted below.	70
Service use areas, industrial shops, gymnasiums, corridors, multipurpose rooms	65
Shower and locker rooms	80
Swimming pools	83

(b). COOLING AND DEHUMIDIFYING

(1). When the building is to be prepared initially for air conditioning, or for future air conditioning, then the system should conform to the following schedule of temperatures and relative humidity:

AIR CONDITIONED (INITIAL OR FUTURE)

Room Classification	Design Temperature & Relative Humidity
Classrooms, assembly and lecture rooms, libraries, homemaking suites, science rooms, general and chemical laboratories.	76° F DB/55% RH

AIR CONDITIONED (INITIAL OR FUTURE) cont'd.

Room Classification	Design Temperature & Relative Humidity
Shops, gymnasiums*, multipurpose rooms, auditoriums, cafeterias, and corridors not used for return air.	78° F DB/60% RH
Toilets and corridors if used for return air.	Secondary effect of cooled air.
Showers and locker rooms	No air conditioning.
Swimming pools	No air conditioning.

2. Air Motion.

   (a). Air motion in all parts of the room shall be sufficient to give uniformity of temperature without objectionable drafts. The air velocity in the occupied zone shall not exceed 35 feet per minute.

3. Quantity of air supply.

   Standard air rating shall be used in all cases. (Standard air is air at 70° Fahrenheit and a barometric pressure of 29.5 inches Hg.)

   (a). NON-AIR CONDITIONED OR AIR CONDITIONED (NON COOLING CYCLE)

Room Classification	Outside Air	Total Air	Total Air Change Per Hour
Classroom, study, lecture room	10 CFM per pupil	30 CFM** per pupil	Not less than 6**
Library, auditorium, gymnasium, play areas, homemaking, shops	2 air changes per hour	-	Not less than 6**
Laboratories - without air contamination	4-½ air changes per hour	-	Not less than 9**
Laboratories - with air contamination	9 air changes per hour	-	Not less than 9

* Refrigerant load determined by normal instructional use.

** Where ceiling radiant heating systems are utilized, an air change rate of 1/2 CFM per sq. ft. of floor area with not less than 10 CFM per student of outdoor air may be used.

(a). NON-AIR CONDITIONED OR AIR CONDITIONED (NON COOLING CYCLE) cont'd.

Room Classification	Outside Air	Total Air	Total Air Change Per Hour
Cafeteria	2 air changes per hour or air needed for kitchen exhaust system whichever is greater		
Serving space, shower and locker rooms	None	-	Not less than 6
Kitchen	None	-	Not less than 10
Laundries, swimming pool	6 air changes	-	Not less than 6
Corridors	None	-	-
Toilets: Each Water Closet			100 CFM
Each Urinal			50 CFM
Each Lavatory			10 CFM
Each Service Sink			50 CFM

For gymnasiums, auditoriums, cafeterias, shops, multipurpose rooms, provide warm weather exhaust systems of a minimum of 8 changes per hour with outlets located at the high points of the spaces.

(b). AIR CONDITIONED (COOLING CYCLE)

Room Classification	Minimum Outside Air
Classrooms, study, and lecture room	5 CFM per pupil
Mass educational rooms	5 CFM per pupil
Auditorium	5 CFM per pupil
Gymnasium and Play Areas	.25 CFM per sq.ft.
Homemaking	.25 CFM per sq.ft. (cooking area .35 CFM per sq.ft.)
Laboratories without air contamination	5 CFM per pupil

(b). AIR CONDITIONED (COOLING CYCLE) cont'd.

Room Classification	Minimum Outside Air
Laboratories with air contamination	20 CFM per pupil but not less than exhaust requirements.
Shops	.25 CFM per sq.ft. but not less than exhaust requirements.
Toilets	See non-air conditioned areas.
Laundries, shower, locker rooms, swimming pool	See non-air conditioned areas.

Cafeteria, serving space, and kitchen:

The cafeteria shall be provided with an air handling system of 1-1/2 CFM per square foot, unless it is a dual purpose room used for assemblies and meetings, in which case it shall be based on 2 CFM per square foot.

The kitchen shall be provided in conformity to the hood exhaust of not less than 150CFM per square foot of hood area, and 15 air changes in the dishwashing area; the conditioned air transferred through the service area to the kitchen will be equal to 25% of the cafeteria air system. If this quantity of air is insufficient to meet the hood and dishwashing requirements of the kitchen, then a filtered tempered outside air system will be introduced to make up a deficit in air quantities.

The minimum fresh air regulation for all schools shall be on the following basis, whether the school is designed for non-air conditioning, air conditioning, or future air conditioning.

Whenever heat is required to maintain stability in the room design temperature, a minimum of 10 cfm shall be supplied to the room for each design occupant.

When heat is no longer being supplied and the room temperature exceeds the design conditions, additional outside air shall be supplied to the area to stabilize the room conditions until 100% of the potential outside air is supplied.

Upon the actuation of the refrigerant cycle in an air conditioned school, through automatic devices the outside air may be reduced to a minimum of 5 cfm per design occupant.

*The following notes are to be observed where applicable:

(1). All school toilets, janitor rooms, shower rooms, locker rooms, kitchen, and rooms covered under note (3) must be mechanically ventilated, separate from the general ventilation system, by exhaust fans discharging the vented air above the roof line and remote from any air intakes.

(2). Lockers, shower, toilet rooms. Where such rooms are large or where it is not practical or desirable to replace the air exhausted from them from adjacent parts of the building, means must be provided to supply and temper outside air to replace exhausted air.

(3). If smoke fumes, odors, inflammable dusts, or other atmospheric contamination or hazard is produced, 100% outside air must be supplied and venting must be entirely separate from the general venting system. In addition, appartus and equipment producing smoke, etc., such as experimental tables, fume cabinets, ranges, steam tables, forges, welding booths, spray painting stations, and the like must be equipped with a mechanical exhaust fan, or fan system, hoods, canopies, their equivalents and accessories to collect smoke, etc., and vent it separately from all other venting. The mechanical exhaust must have sufficient capacity to prevent smoke, etc., from permeating the surrounding air, and must be operated at all times during the use of equipment that does or might produce smoke, etc.

(4). In isolated agricultural and mechanical shops, supply ventilation can be omitted when all venting and exhausting is done as required in other sections of this code. Supply ventilation need be used only when and if tempered air is needed to meet exhaust air volumes.

(5). In figuring the cubic feet of volume of gymnasiums and auditoriums, fifteen (15) plus one quarter (1/4) of the excess over fifteen is used as the effective height or measure of need for ventilation.

(6). Toilets may be vented at floor or ceiling.

(7). Kitchens (not demonstration kitchens) for the preparation of food shall be ventilated by positive exhaust, insuring at least 10 changes (room volumes) of air per hour. The air supply of the kitchen may come from an adjacent dining room, but the dining room itself must have independent supply ventilation..

(8). Positive means of exhaust ventilation for toilets shall be provided entirely separate from any other air supply or exhaust system and shall be capable of removing the air at the rate of at least 10 changes (room volumes) per hour.

(9). Single toilets may be vented with other adjacent areas requiring exhaust, except kitchens.

4. Any school building facility designed with interior instructional areas shall be air conditioned.

5. Temperature of air supplied to rooms

The supply air shall not be admitted to the room for:

Heating - more than 50° above design room temperature
Cooling (side wall distribution) - 20° below design room temperature
Cooling (ceiling distribution) - 25° below design room temperature
Cooling (upward discharge) - 20° below design room temperature

6. The equipment in any locality shall be sufficient to satisfy official requirements under the following outside conditions: (a) Ventilation, 55 degrees F, (b) Heating, 10 degrees F, (c) Air Conditioning, 95 degrees Dry bulb, 75 degrees Wet bulb, or that temperature which after study of the last 20 year record of the Weather Bureau, in that locality, seems to be applicable during the school session.

7. Limitations of capacity of auxiliary heating in classrooms

The capacity of auxiliary heating where used shall be limited to one half the calculated heat loss, so that assurance will be provided that the ventilation system will be used to furnish part of the heat supply.

8. Automatic control

All heating, ventilating, and air-conditioning systems must have automatic controls to assure that the system will function as designed and to meet the minimum requirements of this regulation.

9. Re-Circulation devices

Heating and ventilating and air-conditioning systems which provide for or permit re-circulation of air shall be capable of taking automatically from the outside, the entire amount of air circulated, when necessary to prevent over-heating in mild weather.

10. Room vents into corridors; corridor vents

Any rooms, where re-circulation is permitted, may be vented into corridors in fire resistant buildings, provided (a) one or more vents of proper area be installed for each story height of the building, to vent the air from the corridors, (b) there is no opening, or open passageway between the floors of the school building.

11. Noise (all systems)

The design of the heating and/or ventilating systems shall be such that the resulting noise in the room shall not be more than 3 decibels above the sound existing in the room without the system operating but otherwise normally occupied. Noise level readings are to be taken at the center of the room. Systems of special design using high velocities and employing silence equipment to reduce air noises through apparatus or ducts may be used provided complete detail drawings and specifications are approved in advance by the Department of Public Instruction.

12. Thermometers in rooms

Every school room or recitation room shall be furnished with a thermometer. At least one thermometer shall be placed and maintained in each laboratory, domestic science room, and industrial arts room, and at least two thermometers shall be placed in each auditorium, assembly room and gymnasium.

13. Classroom thermometers - sizes

The thermometer, legally required in every classroom or recitation room, shall be of sufficient size to be read easily, and shall be mounted approximately 5 feet from the floor.

14. Thermometers or thermostats

A thermometer which is attached to a thermostat may be used to record the room temperature, provided it is situated 5 feet from the floor and in a location which serves to indicate the actual temperature of the room.

15. Small occupied rooms - Types of heating and ventilation required.

No provision for mechanical ventilation need be made in small rooms (not including toilets) (either offices or pupils' rooms) which habitually accommodate not more than five persons.

16. Rooms other than classrooms

Heating, ventilating, and air conditioning equipment in rooms other than classrooms shall be placed to give uniform air distribution and temperatures at air velocities permitted in this regulation.

17. Coat rooms and wardrobes shall be positively ventilated

Hanging space in classrooms is not considered a coat room. Ventilation of coat rooms by use of air vented from classrooms is permissible, provided the coat room so ventilated has not less than 10 air changes per hour. If a vent (instead of a doorway, or auxiliary to a doorway) connects the classrooms and the coat room, that vent shall be located at or near the floor.

18. Lockers

Lockers situated in coat rooms or corridors for storage of ordinary clothing shall have ventilation to the extent of ordinary louvers, top and bottom, of their fronts.

19. Radiators in gymnasiums, foyers, stair landings and passageways

Direct or cabinet radiation when used in gymnasiums shall be recessed so that no part of the same shall project into the room. The space in the wall opening shall be either entirely closed with a heavy screen of smooth pattern flush with the wall opening, or with cabinet-type top and bottom openings. Radiators in gymnasiums when set so that the bottom of the radiator is 8 feet or more above the floor need not be recessed and grilles may be omitted.

No radiators shall be placed in foyers, stair landings or passageways which will reduce the passage space to less than that required by the Department of Labor and Industry.

20. Ventilation of projection rooms

Motion picture projection rooms shall be ventilated in accordance with the requirements of the Department of Labor and Industry and other governing bodies having jurisdiction.

21. Ducts

Provision for combustion air must be made in all boiler or furnace rooms. All ducts should be fabricated to meet the specifications of the A.S.H.R.A.E. Guide (current edition) as to metal, gauge, etc.

21. Ducts (cont'd.)

Underground or under slab ducts should be avoided unless made of nondeteriorating material such as terra cotta, transite, etc. All inlet and outlet openings must have rodent and bird screens.

22. Air supply ducts - location of room registers

The bottoms of the openings (registers) of air supply ducts of classrooms shall be not less than 6'-6" above the floor when the air is injected into the room horizontally.

Floor registers are prohibited.

23. Sizes of ducts and air velocities

Sizes of air supply ducts, vent ducts, registers, grilles, roof ventilators, etc., shall be determined so that the maximum volume of air required will be conveyed with velocities not to exceed the values recommended by the A.S.H.R.A.E. Guide (current edition).

Vent duct openings generally shall be immediately above the floor level. If special requirements or architectural designs lend themselves to other arrangements, this explanation should accompany the project when submitted for review.

All vents are to be provided with means to prevent backdrafts.

24. Vents - outlets

Outlet for venting is recommended and in some cases required to be above the roof line, as indicated in another section of this code.

Side wall venting will be permitted when these side wall vents are auxiliary vents or they are outlets for pressure exhausting and provision is made to nullify adverse wind conditions.

In buildings of fire-resistant construction, all classroom, recitation room, or corridor vents may terminate in an attic space and vent therefrom through the roof. In buildings of non-fire resistant construction, flues of fireproof material shall continue through any existing attic to the outside of the building or be assembled in a fire-proof duct in the attic space, and hence to the outside of the building.

Fire dampers are required when common plenum chamber is used or other situations as required by the National Board of Fire Underwriters.

25. Heating, ventilating, and air-conditioning of interior classrooms

The heating, ventilating, and air-conditioning of iterior instructional rooms shall be designed to follow non-conditioned standards during the heating season but shall, in addition, provide positive mechanical cooling and ventilation during the non-heating season.

26. Fresh air intakes

Fresh air intakes shall be above the outside grade. The free area on the approach to the air intake should not be less than ten times the height of the intake. Fresh air intakes shall not be located close or adjacent to bituminous paved area, or located directly on a roof surface.

E. Safety environmental factors should provide for a well-constructed school plant with a minimum of hazards.

1. All items concerning fire and panic are covered by the Department of Labor and Industry and approval of that department shall be secured for all items under its jurisdiction.

(a). Such items are:

Fire alarms
Emergency lighting
Fire extinguishers
Ramps
Means of egress
Fire ratings
Panic bars
Hand rails
Stair towers
Boiler room and boiler platforms
Pressure vessels
Exit signs
Fire protection

2. Electrical

(a). All electrical materials, apparatus, and equipment incorporated in a school building shall be of a type approved or labeled by the National Board of Fire Underwriters Laboratories where such labeling applies.

(b). All equipment not so labeled shall be constructed in accordance with the current rules of the National Electrical Manufacturers Association and American Institute of Electrical Engineers.

(c). The current issue of the National Electric Code shall be observed as minimum standards for the electrical installation. The contractor shall deliver to the owners an official Certificate of Approved Final Inspection from an agency recognized by the Fire Underwriters.

3. Concrete floors in shops shall have a non-slip finish or surface.

4. Interior Doors.

(a). All doors shall open out from instructional and general use areas.

(b). Locks on at least one door from all rooms shall provide a fixed and positive means of operation by pupils from the inside at all times.

(c). Entrance doors to communal toilet rooms shall open out and must be recessed.

5. Pipe spaces, where provided, shall be of ample width for physical access to the piping. Enclosing piping in solid masonry or restricted spaces is not recommended.

6. Cat walks. Cat walks shall be provided in ceiling space in such areas as auditorium, etc., to serve lighting fixtures and ventilating equipment.

7. All exterior exits or entrances shall not have an exterior step within 10 feet. Ramps may be used to meet grade conditions. If steps are necessary, a platform to width of adjacent corridor shall be used at the door, then three or more steps.

8. Glass.

(a). In those traffic areas such as entrance ways, stair wells, and corridors where pedestrians can readily come in contact with glass areas, and in those locations such as gymnasiums and other play areas where there is a likelihood of an object striking glass and thereby causing breakage which might endanger occupants, then the kind of glass used shall be of a type that will not break or disintegrate in a manner to cause injury. Acceptable glass types may be any of the following:

(1). Tempered glass
(2). Wire glass - plain and corrugated
(3). Glass block
(4). Plastic sheets
(5). Laminated safety glass
(6). Other materials as may be approved by the Department

In lieu of the above, the required protection may be in the form of railings, grilles, screens, or other type of protection as may be approved by the Department.

(b). Where clear glass is used in traffic areas as in doors, sidelights, and partitions, such glass areas shall be provided with a visual strip or some other visual identification so that the glass will be noticeable.

9. Industrial Arts and Vocational Shops.

In industrial arts and vocational shops, every portable and stationary electrically operated device or motor, grinder, glue pot, and portable hand and stand lamp shall have its framework grounded and all portable electrical tools and machinery shall be equipped with electrical plugs and receptacles to ground the electrical connections, in conformity with the regulations of the Department of Labor and Industry. At least two emergency control points (with remote manual reset) shall be provided, one at or near each end of the shop to disconnect power source.

10. Water temperature. Domestic hot water shall be provided to all wash fixtures, and controls provided to limit the temperatures at lavatories to 140° and, where required, to maintain 180° for dish washing and other uses required by the Department of Health. Wherever hot water is provided, a circulatory line will be installed to provide immediate hot water at each location.

11. Room stoves or open type of heaters are not permitted in any areas of instructional or general use.

12. All free standing school furniture and/or equipment shall have a sufficiently wide base and a low center of gravity.

13. All open air enclosed courts shall have at least one exit to the outside area of the building either direct or through the building for maintenance purposes.

14. High Pressure Gas and Oil Lines.

Regulations for the installation of high and/or medium pressure pipe lines located on school property, transporting gas, crude oil, kerosene, gasoline, liquified petroleum gases and/or any other volatile products.

(a). Pressure

Gas pressures are listed as low, medium, and high.

(1). Low pressure is defined as the standard pressure delivered to consumers' appliances where house regulators are not required, the maximum pressure not to exceed 12" water column gauge.

(2). Medium pressure is defined as in excess of 12" water column to 10 PSIG.

(3). High pressure is defined as pressure in excess of 10 PSIG.

High pressure distribution and transmission will vary in different areas from 60 PSIG to over 1000 PSIG. There are a number of factors which govern the pressure, that is, size and number of lines serving a given area, demand, distance from source of supply, local regulations, etc.

(b). Pipe Lines (Gas)

(1). Any medium and/or high pressure gas line shall be constructed in accordance with ASA, B31.8 Code, as currently revised, for the service intended. The owner of the line shall certify to the Bureau of Building Construction as to the construction and installation of the line and the maximum pressure at which it will be operated.

(2). Any gas pipe line which is operated at a maximum pressure in excess of 10 PSIG, which line has been constructed in accordance with ASA, B31.8 Code, as currently revised, shall be installed at a minimum distance of 100 feet from any school building, any play area, athletic field, stadium, bus loading or unloading area, or working area.

(3). Any existing gas line operating at a pressure of 500 PSIG or less, not constructed in accordance with ASA, B31.8 Code, as currently revised, shall be located at a minimum distance of 300 feet from

any school building, play area, athletic field, stadium, bus loading or unloading area, or parking area.

(4). Any existing gas line operating in excess of 500 PSIG not constructed in accordance with ASA, B31.8 Code, as currently revised, shall be located at a minimum distance of 500 feet from above mentioned areas.

(c). Petroleum and Volatile Products Pipe Lines

(1). The above regulations shall apply to pipe lines transporting crude oil, gasoline, kerosene, liquified petroleum gases and any other volatile products, which lines shall be constructed in accordance with ASA Code, B31.4, as currently revised.

(d). Pipe Lines under roads or pedestrian walks on school building sites.

(1). Any gas pipe line operated in excess of 10 PSIG crossing under a school roadway or pedestrian walk shall be enclosed in a casing in accordance with the specifications of the American Petroleum Institute Code No. 1102.

(2). On such lines the casing must extend a distance of not less than 25 feet beyond each side and the angle of crossing should be as nearly as practical to 90 degrees.

(3). Any gas pipe line operated in excess of 125 PSIG crossing under a school roadway or pedestrian walk, the requirements of No. 1 above will apply except that the distance from the top of the casing to the surface of the pavement shall not be less than 3'-6".

(4). Any new pipe line included in this regulation shall not be constructed within 25 feet of a school roadway or pedestrian walk unless authorization is obtained from the Department for such construction. Where existing pipe lines are in excess of 125 PSIG and parallel or are within 25 feet of a school roadway or pedestrian walk, the pipe line shall be cased as heretofore specified.

(e). Coverage

(1). A high pressure transmission pipe line shall not have less than 36" of ground coverage at any point within 300 or 500 feet, as applicable, of a school building or assembly area used by school children.

(f). Exceptions

(1). Where circumstances and conditions require the exercising of judgment in applying these regulations, the Department of Public Instruction ruling shall be final.

F. Procedures

1. Department of Public Instruction. Job information sheets. A separate job information sheet shall be provided with a final submission for General Construction; Heating, Ventilating and Air Conditioning; Plumbing; and Electrical Work.

2. Approval is required by the following Departments of the Commonwealth of Pennsylvania before final submission.

(a). Department of Labor and Industry.
(b). Department of Health.
(c). Department of Highways.
(d). State Art Commission.

3. Approval is required by the local municipalities, authorities, or public utilities having jurisdiction.

4. The architect and/or engineer by applying his seal to the drawings does certify that the school plant submitted for final approval has been designed in accordance with this school plant guide and that if installed as shown on his plans and specified will give performance in accordance with the standards and requirements of these recommendations and regulations.

5. Boilers and Furnaces

Boilers and furnaces shall be rated as to capacity and safety according to standards established by the technical groups or society having jurisdiction of particular type and design, such as American Society of Mechanical Engineers, American Society of Heating and Ventilating Engineers, Steel Boiler Institute, Institute of Boiler and Radiator Manufacturers, and Heating, Piping and Air Conditioning Contractors National Association, and American Gas Association. All ratings used by designers must be as indicated above and a direct commitment of the manufacturer as to capacity and rating, either specifically or in published engineering information, is required. All boilers, both as to construction and installation, must meet the requirements of the Department of Labor and Industry. Specifications of the project should so state.

6. Gas Equipment

All gas equipment shall meet the minimum requirements of the local utility and of the code of the National Board of Fire Underwriters as to construction and installation. This shall be included in specifications covering the project.

7. Pressure Vessels

All pressure vessels must meet the requirements of the Department of Labor and Industry and the specifications of all projects shall so state.

8. Piping, fixtures, etc.

All plumbing fixtures as well as their installation with piping, venting, and all phases of installation must meet the minimum requirements as set up in the latest A.S.M.E. Plumbing Code of Standard Code B.M.S. 66. This provision shall be in specifications covering the plumbing phase of all projects.

9. Water supply initially and/or in use must meet and be maintained to meet the minimum requirements of the Department of Health.

10. Field type of sewage disposal system for an addition to an existing school.

If a subsurface drainage field type of sewage disposal system for an addition to an existing school is presented, the information covering the existing facilities must be submitted with plans and specifications. Such an addition shall have prior clearance of the Local and State Department of Health before submission to the Department of Public Instruction for approval.

11. Sewage Disposal

(a). Type of system

Sewage disposal connection to an existing approved system is highly desirable. If not available, an independent system must be designed. Cesspools or seepage pits are not approved unless specifically authorized by the Department of Health for specific installations.

(b). Approval by Department of Health.

Plans and specifications covering all independent sewage systems shall be presented to the Department of Health for review and report.

Clearance of a project by the Department of Public Instruction is contingent upon approval by the Department of Health.

12. Kitchens and Cafeterias

Food handling facilities such as kitchens, cafeterias, and snack bars under the jurisdiction of the cafeteria supervisor, are subject to clearance by the Chief of Lunch and Nutrition of the Department of Public Instruction, Education Building, and the Regional Office of the Pennsylvania Department of Health prior to submitting a project to the Department for final approval. The clearances shall be on file with the Department at the time of final submission.

13. Specialized Areas

Approval of the interested department specialist as to utilization of specialized areas and arrangement of equipment to include facilities for music education, health, and physical education, homemaking, shops, art, library, commercial, cafeteria and kitchen, should be obtained prior to the submission of final plans and specifications to this Division.

14. The following publications (current edition) other than those mentioned above should be used as a supplementary guide in developing the various environmental factors for school plant design.

(a). NCSC Guide - National Council on Schoolhouse Construction.
(b). American Standard Guide for School Lighting - American Standards Association, Inc.
(c). IES Lighting Handbook - Illuminating Engineering Society Lighting Handbook.
(d). Recommended Practices of Daylighting - Illuminating Engineering Society.
(e). American Standard Specifications for Making Buildings and Facilities Accessible to and Usable by the Physically Handicapped.
(f). American Society of Heating, Refrigeration, and Air Conditioning Engineers Guide.
(g). National Plumbing Code.
(h). American Standard Code for Pressure Piping ASA B31.8, ASA B 31.4.

E 6000 (9-65)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON 25, D.C.

ERIC DOCUMENT RESUME

DATE OF RESUME: 6/29/66

1. ACCESSION NO.

2. ERIC SATELLITE CODE

3. CLEARING HOUSE CONTROL NO.: SC 861

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4. SOURCE: Department of Public Instruction
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TYPE OF RELEASE

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15. ABSTRACT *(250 words max.)*

Outlines minimum standards for new building, alterations, and additions with reference to the following: (1) spatial environmental factors, (2) visual environmental factors, (3) sonic environmental factors, (4) thermal environmental factors, and (5) safety environmental factors. Specifications include an analysis by grade levels and general usage.

16. RETRIEVAL TERMS *(Continue on reverse)*

planning school plants
new school buildings
school building additions

17. IDENTIFIERS

Pennsylvania